

By Dale Karch & Todd Smith

Bow-building tools

Handcrafting beautiful all-wood bows from staves split from tree trunks is an art. There was a time when we might have considered calling it a lost art. We remember reading an endorsement from the late Fred Bear when commenting to Glenn St. Charles about the bowbuilding video Glenn had just produced. He said something to the effect that it was about time someone had documented the self-bow building process, and he was glad someone did it before the knowledge disappeared forever.

That was nearly 20 years ago and my how the times have changed! Now there are thousands and thousands of people making their own bows from wood. The tide has turned and even many of those within the umbrella of “traditional archery” are coming full circle. They’re looking to find their roots, or at least the roots of the very bows and arrows they’ve come to love. They’re looking for a deeper connection to their sport, and with that connection comes an awareness of a simpler time. A time of carefully crafted “works of art”, bows and arrows that make you weak in the knees they’re so well made, and so very beautiful.

There’s another group who yearn to produce their own bows and arrows. Kids. We see youngsters, enthralled by movies like “The Lord of the Rings”, who decide they want to build themselves bows and arrows. These kids normally start in on mom

and dad to find them an archery shop they can check out. They want to build their own bows. What an opportunity it is for mom or dad to do something meaningful with them, something that takes effort, study, commitment, and responsibility. In other words, a perfect project to use as a growth experience for kids or grandkids. You may want to even consider it for your own family project.

Our point here is that the demand for the tools used in bowbuilding is growing daily and since most local folks turn to the phone book and look up “Archery” for bowbuilding supplies, it makes sense that the local archery shops would have some of these tools on hand.

If you’re going to build self-bows, you’re going to need tools. Yes the American Indians made them with nothing but stone tools. Be honest with yourself, how much time do you have? How much time do your customers have? (Answer: Typically not the time it would take to use all stone tools!)

We’re going to discuss some of the more popular “modern” tools for making self-bows. (Self-bows are bows entirely made from one piece of

wood.) It’s easy to get started building your own bows from wood but the many tools available may be a bit confusing for a newcomer to the craft. For that reason, we intend to describe the more popular tools for bowbuilding to enlighten our readers to the benefits of each.

Once someone gets the fire for bowbuilding, the tools used in the process become more than just tools. They represent bows yet to be made. Bowmaking tools seem to almost have a life of their own, and bowyers value them highly.

We’ll start with the most aggressive of the tools and proceed through our list. First on the list is the drawknife. It’s called a drawknife because it’s designed to cut by drawing it toward you. The blade has only one bevel and as such, allows you to select bevel up, for more aggressive cutting or bevel down for more controlled cutting. The drawknife is an indispensable tool. Few ever attempt to make an all wood bow without one, yet it’s really best used for the rough shaping of your bow and not for the more delicate work of final shaping and tillering. Many modern day bowyers are using antique drawknives they’ve picked up at

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No tool says, "bow making" like the venerable draw knife. This unique style with its round handles is a good choice for bow building. A short draw knife is shown below. This obscure carving tool offers excellent control and is especially effective on softer woods like Yew.



garage sales and flea markets. Many of these old tools have plenty of life left in them and will do a great job. These older versions are shaped to facilitate the quick removal of wood from a bow stave. For bowbuilding, we offer a unique eight-inch bladed drawknife with round palm-filling handles rather than the elongated handles found on the antique varieties. It's a smaller drawknife designed for more detailed work than the antique versions, it's very well designed and lends itself perfectly to bowbuilding. They're readily available and it's easy to keep a supply on hand at all times.

The short drawknife is a little gem that's often overlooked, but is actually quite handy for all kinds of carving. The handles are in-line with the tool and offer you complete control of your depth and direction of cut. They can be particularly effective when working a stubborn spot in a bow belly that has grain running in opposite directions. Since the blade is beveled equally from both sides, it can be used in any orientation to your working surface. The short draw knife is a very handy tool to have in a bowbuilding workshop.

Spoke shaves, as the name implies, were originally designed for shaping spokes for wagon wheels. They certainly have their place in the bow builder's tool chest. When adjusted properly, they are capable of removing beautiful thin shavings in a very controlled manner. The design allows two-handed operation, which



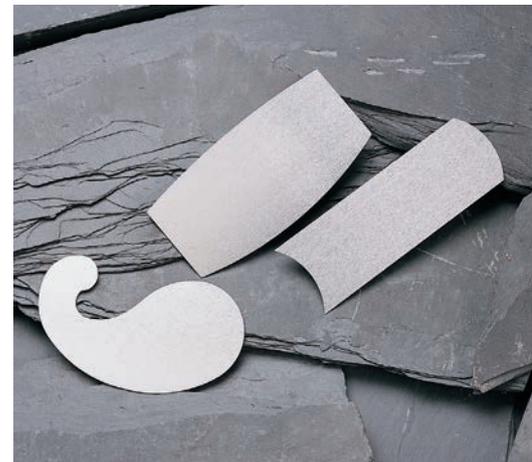
Like the drawknife, the spoke shave is recognized as one of the essential tools for bow building.

results in total control and helps to eliminate fatigue. Spoke shaves are excellent shaping tools and are especially useful when the drawknife is too aggressive and it's still too early in the shaping stage to switch to the cabinet scrapers. Can you get by without a spoke shave? Yes you can. Would you want to? We don't think so. It's a small investment for a tool that'll last several lifetimes. We recommend the cast bodied Stanley flat based model for bowbuilding.

Cabinet Scrapers are the ultimate bowbuilding tools. If you've never used a metal cabinet scraper with a nice burr rolled on it you've missed one of the true joys of woodworking. Unfortunately, not everyone who acquires one of these tools knows about rolling the burr on them. If you've ever tried one without the burr, you were probably tempted to toss it in the trashcan. Without a burr, trying to work wood with it is like trying to fillet a fish with a butter knife, it just doesn't work. HOWEVER, once a good burr is rolled on the sharp metal edge of these handy tools, we guarantee you'll wonder how you ever got along without them. They'll peel off the prettiest paper-thin curls of wood you've ever seen. Trees grow in wild shapes: Sometimes the grain may swirl, curl, and even change direction. For that reason scrapers come in several shapes, straight, curved, and gooseneck are the most commonly available.

You can't discuss cabinet scrapers without mentioning the burnishing tool. Each tool is useless without the other. A good burnishing tool is the secret to good scraper results. What you need is a hardened steel burnisher tempered harder than the scraper so it can force the metal of the scraper edge into the proper hook-shape. "OK, but how do I do that?" You might be asking.

Burnishing a scraper is a straightforward process that once learned will take the mystery out of cabinet scraper usefulness forever. Think of your scraper as a rectangle of hardened steel about 1/32 to 1/6 of an inch thick. We're going to dress-up the outer edges of the scraper first. First you must square up those edges. With a smooth file remove any burrs from the outer edge of the scraper. We're striving for an edge with ninety-degree angles. Once you've removed all previous burrs with your file, polish all three surfaces of the edge with a medium to fine grit sharpening stone. When your edges are clean and smooth at ninety degrees, it's time for the actual burnishing. Place the scraper in a padded vise with approximately one inch of the blade sticking up out of the vise and running parallel to the floor. Take your burnishing tool and with one hand on either side of the tool, push down on the top surface of the scraper as you push from back to front on that surface. Repeat many times, (10-20) each time bearing down on the scraper with the burnishing tool with a lot of force. Twist your wrists and visualize that you're changing the shape of the nice ninety-degree square edges to a rounded mushroom-like shape. The bottom edges of this mushroom shape are



Available in many shapes, cabinet scrapers are the tool of choice for most of the final shaping and tiling of a bow. A hardened steel burnisher (shown below) is a "must have" tool for turning a good edge on cabinet scrapers.



actually sharp hook-edges of steel that, if shaped correctly, will perform like a tiny plane blade. They'll peel fine delicate shavings of wood from your bow as you work it. Once you get your cabinet scraper properly "burred" it is a joy to use and it'll become your "go-to" tool for working down the belly during the tillering process.

A relative newcomer to the world of bowbuilding is the "Smooth Scraper". The idea here being that with your scraping blade mounted to a two-handed handle, you gain a lot of leverage and control. The hardened steel blade lasts and lasts while you scrape bow after bow, but this is not a tool for hogging a bunch of material off with a lot of pressure. It's more of a shaping tool. Its design will let you know if you're getting too aggressive with it. It's definitely another tool that once you use it, you won't want to be



The little 1 inch block plane is a big help especially on the edges of self bows and bamboo backed bows.

without one.

Another tool from the scraper family is the Mystic Scraper that comes to us from Bernie Swank of Mystik Longbows. This tool comes ready to work. No burnishing required, its thick design utilizes more sharp corners than the more delicate burr-hook found on normal cabinet scrapers. That makes this a popular tool with self-bow builders everywhere.

The 1 inch block plane is a very underrated tool that comes in handy when shaping limbs. At less than \$10, it's very inexpensive and easy to work with when shaping a limb whether you're working on a flat edge surface or shaping a rounded belly.

Remember, you have to install your string grooves on the ends of both limbs so the nock file is a necessity. There's no better way to shape the string grooves than with a thin but fairly long round file. There's no need to be any thicker than the string you'll be using, so thin is good. Long is good too because the longer your file is, the faster the job will be for you. There are auxiliary handles available for them as well that help keep the file under your control and allow extra leverage. Even if you're only looking to build a few bows, this is one tool you can't afford NOT to have.

If you plan on using bamboo to back a self-bow you'll need to look into a tooothing plane or a tooothing scraper. These tools produce grooves on both of the gluing surfaces to allow the adhesive to expand and hold better due to the increased surface area. The drawback to tooothing planes is they're expensive, retailing for over



The Smooth Scraper was designed specifically for bowbuilding. The handle and sharp blade combination is the secret to success for this handy little tool. The Mystic Scraper at right is unlike regular cabinet scrapers in that it's thick and inflexible, yet turns a nice fine shaving.

\$100. So, you'd need to decide how many of these bamboo-backed bows you intend to make to see if you could justify the cost. Thankfully, there's a new product called a Tooothing Scraper. It functions in much the same manner, but as the name implies, it's more of a scraper than a plane. This tool, with its lower price (less than \$40.00) is perfect for the bow builder who may want to make only a few bamboo-backed bows. The bowyer needs one or the other of these tools when planning to bamboo back a bow. If many bows are to be made, the tooothing plane is worth the investment, if only a few will be made, the tooothing scraper is much more reasonably priced.

An article on tools for building self-bows wouldn't be complete without mentioning the "Shaving Horse". Modeled after the old "Coopers Bench" used by wheelwrights long ago when working on spokes for wagon wheels, they lend themselves perfectly to self-bow building. With a little leg-pressure, the vise will hold your stave in place while you shape it with your tools. The shaving horse is quick, handy, and somewhat expensive, but certainly worth consideration. When the budget is tight, many would be bowyers simply mount a padded vise to a bench top and make do with that. It still works well, but is much more tedious when you're continuously changing the bow's position than when working with the quick-change feature of the shaving horse. For someone planning on lots of bows, the shaving horse is the better choice.

Many people use aggressive rasps to hog-off material. The Versa-File fits that niche wonderfully. Designed with an aggressive cut and very sharp "teeth" this tool performs well on nearly any surface, from wood, to wood and fiberglass, and even metal. As the name implies, it's truly a versa-



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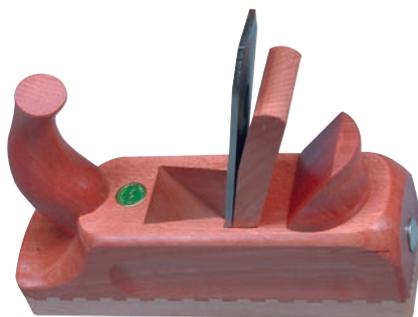
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tile file. To get the most from your Versa-file you'll need a file base. We have one that's designed to multi-task. You can either mount your Versa-file to it and shape away (The file base converts the Versa-file to a tool very similar to a wood-plane) or you can also attach sanding strips to it and make short work of the sanding processes involved when building a self-bow. This is a clever tool built one-at-a-time by a local woodworker.

When talking about bamboo backing a bow, you need to mention the recommended adhesives. Bow adhesives can be tricky, so we recommend keeping it simple. We only offer two types, Smooth-On EA-40 Epoxy, and Urac-185. If you're looking for only one adhesive, make it the Smooth-On EA-40. It's used almost exclusively on all fiberglass-to-wood style bows built in the United States. The bow laminations don't have to be grooved, and bow failure is nearly unheard of. (Unless the bowyer doesn't get enough glue in a joint, or uses too much pressure in his clamping system and forces too much of the glue out of the joint.) Urac-185 has been used for years for wood-to-wood applications and is superior to nearly any other glue in bowbuilding applications. Some would argue that it's even superior to Smooth-On EA-40 for wood-to-wood joints. Urac-185 expands as it cures so the surfaces you intend to bond must be scored. Urac is not an epoxy. It can be used with or without the hardener. It sets up faster when you use the hardener and will do a better job of filling any voids in



When working with bamboo the toothing plane has no equal, easily reducing your bamboo to final shape and thickness while leaving the perfect surface for the gluing process. While not designed as a thickness reducing tool like the toothing plane, the toothing scraper shown below will prepare any wood or bamboo surface for the gluing process.



The Versa-File is an excellent shaping tool, especially useful in rounding edges and smoothing surfaces left by draw knives and spoke shaves. This versatile tool shown below works with either the aggressive Versi-File or sandpaper strips.



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your joint. The bottom line is, if you want to carry only one adhesive, make it the Smooth-On EA-40. If you're open to the idea of a second adhesive, you can't go wrong with Urac-185. It's very popular with the old-style bowbuilding crowd.

With the proper mix of the tools mentioned above, you could start making your own bows. Some are more specialized than others, and some are indispensable. We hope we've shed some light on a somewhat confusing topic and that you're now comfortable in selecting the tools you'll need to offer for customers looking to make their own self-bows. Who knows? You may decide to build a few for yourself. If you do, you'll know where to go to get your tools, right?

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ABOUT THE COLUMNISTS: A former tool and die maker who is no stranger to precision work, Karch spent three years working full time as a bowyer before he and wife Sandie purchased 3Rivers Archery. Running the business has given him a unique perspective on the traditional side of the archery industry. Todd Smith lived in Alaska for several years and trained under master fletcher John Dodge, well known for making some of the finest cedar arrows ever offered. From 1988 to now, Todd has been the "Right Hand Man" at the Ashley, Indiana distributor.



Urac 185 has long been used for all wood to wood or bamboo to wood applications. Many old-time bowyers will use nothing but their trusted Urac. Smooth-On EA-40 bow adhesive (at right) is THE number one choice of bowyers everywhere, so should be what you carry if you decide to stock a single adhesive.



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